

REMARKS

Applicants have carefully reviewed the arguments presented in the Office Action and respectfully request reconsideration of the claims in view of the remarks presented below.

Claims 1, 3 5 and 7 have been amended, and claims 4 and 13 were canceled. Thus claims 1-3 and 5-12 are pending in the application.

Claims 1 and 2 were rejected under 35 U.S.C 103(a) as being unpatentable over Wang et al. (US Patent No. 6,212,420) in view of Linford et al. (US Patent No. 5,854,850). Claims 3-8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Want et al. in view of Linford et al. and further in view of Bartoli et al. ("Virtual Colon Flattening", May 2001). Applicants respectfully traverse these rejections in view of the amendments made to the claims.

Claim 1 was amended to recite that the method of rendering a flattened view of a tubular body structure includes Projecting a ray from a starting point to the wall of the tubular structure and shifting the angle of view by one degree in a selected direction, projecting another ray from the starting to the wall provided that the angle of view has not been shifted a total of 180 degrees from the initial starting point. If the angle of view has been shifted a total of 180 degrees, the angle of view is returned to the starting point and the process is repeated in the direction opposite to selected direction until the angle of view has been shifted a total of 180 degrees in that direction.

None of the prior art, taken alone or in combination teach or even suggest such a method. Wang et al. actually teaches away from the methods recited in claim 1 by instead introducing a method of using "electrical fields" to prevent overlap and thus miscounting of structures of interest such as polyps. Nowhere does Applicant claim to use such "electrical fields" in the rendering of a flattened image. Moreover, Wang et al. teaches constructing a rectangular grid of data points that is then mapped into polar coordinates. Applicants claim that the data representing the flattened view is voxel data in amended claim 3. As those skilled in the art understand, voxel data represents a three dimensional volume element and is completely different from rectangular grid data mapped into polar coordinates.

Bartoli et al. discloses using a ray tracing method to project a region of a surface onto a cylinder which is then used to render a flattened image. However, Bartoli et al. does not teach incrementing an angle of view through 180 degrees, returning to the start point, and then incrementing the angle of view through 180 degrees in a direction opposite to that of the initial incrementation. Moreover, while Bartoli et al. does disclose direct volume rendering compositing to calculate a color which correspond to the cylinder point where a ray is projected, Applicants' method renders a flattened image directly, and does not require the intermediate step of mapping the surface to a cylinder.

Further, Bartoli et al. specifically state that the increment in the "h" direction must be less than or equal to the size of a voxel. Applicants' claimed bidirectional method of generating the data set allows use of any size increment along the longitudinal axis. Thus, even if Wang et al. and Bartoli et al. are combined as suggested, the novel inventions recited in claim 1 and its dependent claims would not be obtained by one skilled in the art. Moreover, the motivation to combine the art is lacking in that the disadvantages inherent in the method of Bartoli et al. are exactly the disadvantages that Wang et al. are trying to avoid.

For all of these reasons, Applicants respectfully submit that claim 1, and the claims dependent therefrom are neither disclosed nor rendered obvious by the prior art, taken alone or in combination.

Claims 7 was amended to more clearly point out that it recites a method for generating a view of the tissue structures within a thickness dimension of a wall of a tubular structure of a body. Specifically, claim 7 was amended to recited the step of project a ray towards the wall a selected distance by stepping towards the wall along the ray from the starting point, the distance selected such that the ray steps into and through the thickness of the wall. There is no disclosure of such a method in any of the cited art. Bartoli et al. specifies that the ray extends only to the inner surface of the wall. Moreover, both Wang et al. and Bartoli et al. are concerned with structures on the surface of the inner wall of the colon, or that extend from the inner wall of the colon into the lumen of the colon. There is simply no disclosure within either reference of the need for a method to be able to visualize structures within the wall of the colon. Applicants' invention of claim 7 allows visualization of such structures, which offers an additional and

important capability to a care giver of being able to visualize and asses tumors or other structures found within the wall of a tubular structure that would otherwise not be apparent when visualizing just the surface of the inner wall of the tubular structure. Thus, even if Wang et al. and Bartroli et al. are combined as suggested by the Examiner, one skilled in the art would not appreciate that extending the ray into and through the wall of the tubular structure would result in the benefits provided by Applicants' claimed method.

For all of these reasons, Applicants submit that claims 1 and 7 as amended, and the claims dependent therefrom, are novel and not obvious in view of the cited art, and respectfully request that the rejections be withdrawn and the claims allowed.

CONCLUSION

Applicants have carefully reviewed the arguments presented in the Office Action and respectfully request reconsideration of the claims in view of the remarks presented. In light of the above amendments and remarks, Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Should the Examiner have any questions concerning the above amendments and arguments, or any suggestions for further amending the claims to obtain allowance, Applicants request that the Examiner contact Applicants' attorney, John Fitzgerald, at 310-242-2667.

The Commissioner is authorized to credit any overpayment or charge any additional fees in this matter to our Deposit Account No. 06-2425.

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Respectfully submitted,

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